

was there that Dr Waterhouse and Brigadier Evans caught, on a barren cliff overlooking the sea, more specimens than in all the world collections. But alas it has become a seaside resort and the barren cliff is now all built over. And though I have looked for Motasingha in other bleak places it does not seem to be there. Twelve species in a South Australian back garden does not sound a lot but the changes in 30 years are worth recording.

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On the *Zygaena* Fauna of the Neighbourhood of Lake Van in Asia Minor (Lep., Zygaenidae)*

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In 1970 and 1971 Mr F. Schubert collected in Asia Minor around the neighbourhood of Lake Van and sent us the *Zygaena* which he found. We thank him here for his kindness.

1. *Zygaena (Mesembrynus) cuvieri* Boisduval.

H. Reiss wrote on *cuvieri* in the year 1932 and enlarged on Boisduval's original description. The probable type locality of the species, Amadia (Environs d'Amaden), Iraq, lies about 190 km (as the crow flies) south of Lake Van. Tremewan (1961) figured the type ♂ of *cuvieri* Boisduval with a wing span of 40 mm. We have before us: 1 ♂, Tatvan, Lake Van, 1800 m, 1-13.6.1970, leg. Schubert, wing span 35 mm, and 2 ♀♀ from the same locality, 6.1971, leg. Schubert, wing span 30 mm, 33 mm.

These specimens could stay next to the type population, likewise 1 ♂ labelled Haj Omran, Rayat, Iraq, 5000-6000 ft., 12-13.6.1956, leg. Wiltshire, wing span 36 mm, in coll. Reiss. Rayat lies about 140 km (as the crow flies) east of Amadia. 1 ♂ from Tatvan and 1 ♂ from Haj Omran are illustrated (figs. 1, 2).

2. *Zygaena (Mesembrynus) punctum* Ochsenheimer ssp. *vanica* n. ssp.

We have before us: 1 ♂, Bitlis, Lake Van, 1700 m, 6.6.1970, leg. Schubert, and 2 ♀♀, Tatvan, Lake Van, 1800 m, 6.1971, leg. Schubert.

In facies these specimens differ from all races of *punctum*. As far as is known it is the most easterly locality for the species in Asia Minor. The wing span in the ♂ is 24 mm, in the ♀♀, 26 and 27 mm. The antennae and body are blue-black, with a slight sheen. The normally whitish patagia are almost

*The order follows the Systematic Catalogue of the Genus *Zygaena* Fabricius (Lepidoptera: Zygaenidae) by Hugo Reiss and W. Gerald Tremewan (1967).

black. the thorax is not whitish haired and the tegulae are only tipped with white at their apices. The warm yellowish red of the forewings covers almost the whole of the forewings in the spot area. the apex, termen and inner margin remaining blue-black. with a slight sheen. The fringes are yellow. The red of the hindwings is somewhat less mixed with yellow. The blue-black hindwing border is only distinct at the apex. Underside as upperside, only somewhat matter.

We name this race ssp. *vanica* n. ssp. after the area where it occurs. The illustrations (fig. 3, 4) show especially the size, the wing shape, the length of the antennae, the form of the red spot area and the hindwing border.

Holotype ♂. wingspan 24 mm, allotype ♀. wingspan 27 mm, and paratype ♀ in coll. Reiss.

Z. punctum anatoliensis Reiss from Ak-Schehir. 1000-1500 m. Asia Minor. and *punctum malatina* Dziurzynski from Malatia. Taurus. Asia Minor. are on average smaller. and show. especially in the ♀ distinct white patagia and distinct whitish hairing on the thorax. The wing shape is mostly pointed.

3. *Zygaena (Mesembrynus) cambusea* (Lederer) ssp. *rosacea* Romanoff.

This subspecies was described from Istissou near Erivan, Armenia. The specimens before us, 1 ♂, Tatvan, 1800 m, Lake Van, 1-13.6.1970, wing span 32 mm, 1 ♀ with same data, wing span 30 mm (worn) and 1 ♂ with same data, 6.1971, wing span 25 mm (worn), all leg. Schubert, stay next to ssp. *rosacea*. The ♂ from Tatvan, 1-13-6.1970, wing span 32 mm, is illustrated (fig. 5). Further material is awaited.

4. *Zygaena (Mesembrynus) smirnovi* Christoph ssp. *tatvanica* n. ssp.

H. Reiss (1933) has enlarged upon the original description of *Zygaena smirnovi* Christoph and figured 1 ♂ from Achal Tekke, Aschabad, wing span 30 mm, coll. Reiss. The likewise illustrated ♂ of ssp. *persica* Burgeff (Cotype), from North Persia, wing span 34 mm, coll. Reiss, that was acquired from the firm of Staudinger and Bang-Haas. does not quite agree with the description of *persica* Burgeff (1926), because the spots 5-6 of the forewings are not completely isolated from the remaining spots. The locality of ssp. *persica* Burgeff (collector Tancre) is not exactly known. Kuldsar, north-east Persia, is likewise given as a locality. The typical *Z. smirnovi* from Achal Tekke, Nuchur, and ssp. *persica* from north Persia, are described and figured by Reiss (1930) in Seitz: The Macrolepidoptera of the World, Supplement 2. Haaf (1952) figured the ♂ genitalia of *smirnovi persica* Burgeff from Kuldsar, Persia. ex Bavarian State collection. H. Reiss & W. G. Tremenwan (1960) illustrate typical *smirnovi* from Nuchur, cotype ♂, ex coll. Christoph, a *smirnovi* ♂ from Aschabad, ex coll. Reiss, and the genitalia of both these specimens. A further locality

of *smirnovi* from near Hasankif, in the Tacht i Suleiman group of the Elburz Mountains was recorded by H. Reiss (1937).

Mr Schubert sent us 3 ♂♂, 3 ♀♀, labelled: 'Tatvan, 1800 m, 1-13.6.1970, Lake Van region, Asia Minor, and 14 ♂♂, 11 ♀♀ from the same locality, 6.1971. The genitalia preparations and photographs of same 3 ♂♂, 1 ♀, kindly prepared by Mr F. Heller, Natural History Museum, Stuttgart, show that the specimens belong to *Zygaena smirnovi* Christoph and represent an undescribed subspecies of that species. Wing span: 1 ♂ 26 mm; 3 ♂♂ 27 mm, 1 ♂ 28 mm, 2 ♂♂ 29 mm, 2 ♂♂ 30 mm, 7 ♂♂ 31 mm, 1 ♂ 32 mm; 2 ♀♀ 27 mm, 1 ♀ 29 mm, 3 ♀♀ 30 mm, 5 ♀♀ 31 mm, 3 ♀♀ 33 mm.

The ground colour of the body and the antennae is black with a light blue sheen. The hairing of the body is thin. The strong antennae are heavily clubbed in the ♂♂; in the ♀♀ the antennae are weaker and less heavily clubbed. The legs are black with a bluish sheen. The wing shape is sometimes pointed. The dark ground colour of the forewings has a blue sheen in the ♂♂; in the ♀♀ it is more inclined to a bluish green sheen. The red of the forewing streaks is a delicate warm light carmine, the red of the hindwings is even more delicate, almost translucent; the basal area of the hindwings is more strongly scaled. The forewing streaks are confluent. Spot 1 runs along the costa as far as spot 3, the lower streak (spots 2-4) is joined to spot 1 by red scaling, likewise the streak consisting of spots 3-5-6. The veins are dusted with red scaling. The axe-shaped spots 5-6 generally show the dilated characteristics of *smirnovi*. The pale blue-black hindwing border is more or less strong only at the apex; in 1 ♂, 1 ♀ it runs to the tornus. In 4 ♀♀ the hindwing border is lacking. The fringes are black and always darker than the ground colour of the wings; in 1 ♀ the fringes are shaded with yellow. The underside of the wings is as the upperside, only somewhat matter. We name this good race ssp. *tatvanica* n. ssp. after the locality. Holotype ♂, wingspan 31 mm, allotype ♀, wingspan 31 mm, and all the paratypes in coll. Reiss.

The illustrations (figs. 6-9) show especially the size, wing-shape, form of the antennae, the forewing streaks and the hindwing border.

Zygaena smirnovi smirnovi Christoph and *smirnovi persica* Burgeff differ from *tatvanica* through the size, wing-shape, and the somewhat different streak formation of the forewings. *Zygaena purpuralis* Brünnich and its races, likewise *Zygaena diaphana* Staudinger and its races, show different genital structure. Biological data on *smirnovi* Christoph and its races are desirable to confirm its specific status.

5. *Zygaena (Agrumenia) loti* Denis & Schiffermüller ssp. *tatvanensis* n. ssp.

We received 4 ♂♂, 3 ♀♀, labelled Asia Minor, Lake Van

region, Tatvan, 1800, 6.1971, leg. Schubert. Wingspan: 1 ♂, 27 mm, 3 ♂♂ 28 mm; 1 ♀ 27 mm; 1 ♀ 28 mm; 1 ♀ 29 m.

The ground colour of the body and antennae is black with a slight blue-green sheen. The hairing of the body is weak. The double yellowish patagia is indicated. The tegulae are tipped with yellowish. The antennae are more strongly clubbed in the ♂♂ than in the ♀♀. The legs are yellow on the outer sides. The wing shape is generally pointed. The blue-black ground colour of the forewings is present only at the apex on both the upper and underside. The red of the forewing spots is a very delicate carmine-rose, the red of the hindwings is even more delicate, almost translucent. Spot 1 of the forewings runs along the costa, which in the ♀♀ is dusted with yellow, as far as the small spot 3 with which it is joined by red scaling. The larger, almost square spot 4 is separate from spot 3 and has the tendency to be lightly connected to spot 2 in the male. The large almost triangular spot (5-6) is always free and has no connection with spots 3 and 4. The forewings are, with the exception of the blue-black apex, dusted with yellowish scaling. The hindwing border is absent. The fringes are darker than the ground colour of the apex of the forewings, outwardly tipped with yellow. The underside is as the upperside but somewhat matter.

We name this race ssp. *tatvanensis* n. ssp. after the locality. Holotype ♂, wingspan 28 mm, allotype ♀, wingspan 28 mm, and all paratypes in coll. Reiss.

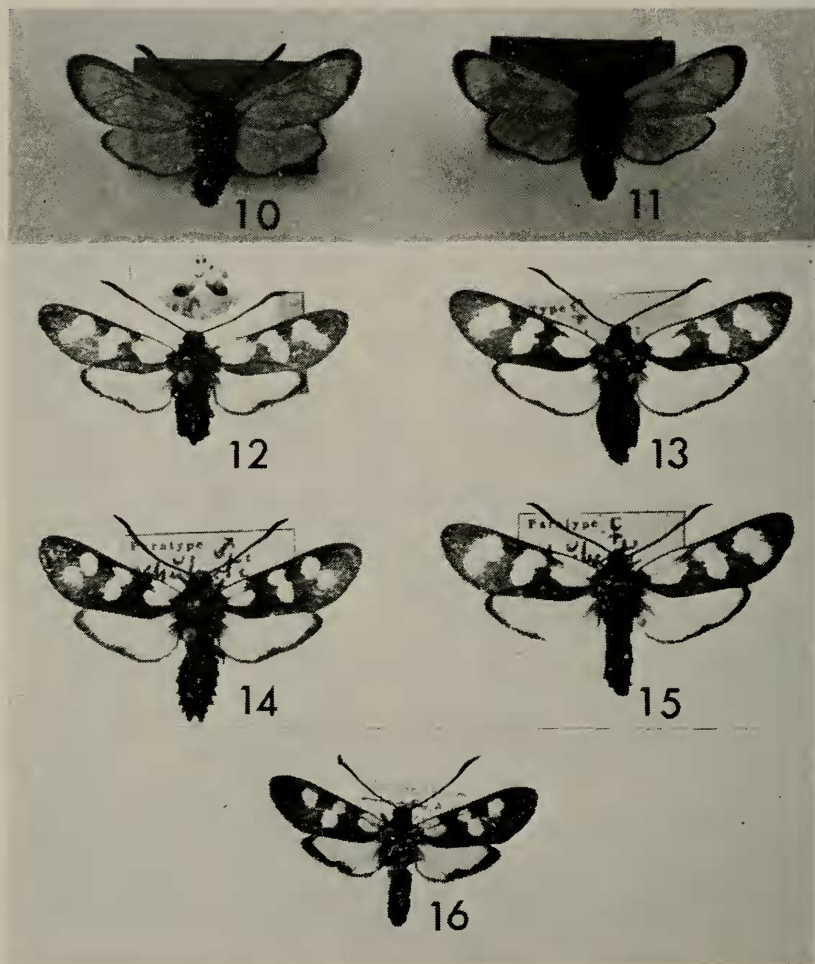
The illustrations (figs. 10, 11) show especially the size, the form of the wings, the antennae and the spot pattern.

Zygaena loti antiochena Staudinger from Antiochia, Asia Minor, and *loti phoenicea* Staudinger from Malatia, Taurus, Asia Minor, are thickly scaled and show very strong dusting of scales in the confluent forewing spots.

Zygaena loti anatolica Burgeff from Eski-Shehir, southern Anatolia, Asia Minor, is on average smaller, and has above all a somewhat warmer red and smaller forewing spots, especially spots 5-6. It shows a stronger inclination to confluence of the forewing spots. The yellowish scaling of the forewings is lacking in the ♂ or is only slightly represented. A narrow blueblack hindwing border is also present.

Zygaena loti eriwanensis Reiss from the vicinity of Erivan, Armenia, and *loti aktashi* Koch from Khashkhash Dagh, Aktash, Kars, West Armenia are above all more strongly scaled, show a warmer red and reduced spots 5-6 on the forewings. The yellowish scaling of the forewing is lacking in the ♂ or is only lightly represented.

Zygaena loti suleimanica Reiss from Tacht i Suleiman, Hasankif, Elburz Mountains, Northern Iran, 1000 m, is larger with more pointed wings. It has smaller forewing spots, especially spots 5-6. The red of the forewings is a warm, more mixed with yellow, carmine-red and the hindwings show a dark rose-red. The yellowish scaling of the forewings is lacking and is replaced by the yellowish edging of the spots.



- Fig. 10. *Z. loti tatvanensis* n. ssp., holotype ♂, wing span 28 mm.
 Fig. 11. *Z. loti tatvanensis* n. ssp., allotype ♀, wing span 28 mm.
 Fig. 12. *Z. filipendulae schuberti* n. ssp., holotype ♂, wing span 31 mm.
 Fig. 13. *Z. filipendulae schuberti* n. ssp., allotype ♀, wing span 35 mm.
 Fig. 14. *Z. filipendulae schuberti* n. ssp., paratype ♂, wing span 36 mm.
 Fig. 15. *Z. filipendulae schuberti* n. ssp., paratype ♀, wing span 36 mm.
 Fig. 16. *Z. lonicerae* Scheven ssp. ♂ Tatvan, wing span 27 mm.